DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
10117 PRINCESS PALM DRIVE, SUITE 120
Tampa, Florida 33610

REPLY TO
ATTENTION OF

Tampa Section

December 23, 2008

PUBLIC NOTICE

Permit Application No. SAJ-2003-08482(IP-MLS)

TO WHOM IT MAY CONCERN: This district has received an application for a 10 year Department of the Army permit pursuant to Section 404 of the Clean Water Act (33 U.S.C. §1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. §403) as described below:

APPLICANT: Pinellas County BOCC
Attn: Mr. Samuel Parker
Solid Waste
3095 114th Avenue North
St. Petersburg, FL 33716

WATERWAY & LOCATION: The Treasure Island II Artificial Reef site, is located in the Gulf of Mexico, approximately 26.6 nautical mile at 257° heading west of John's Pass and the following GPS coordinates:

LATITUDE & LONGITUDE: Four corners and center point follows:

NW Lat:	27°41.82'N; (NAD 83 27.696944)	Long: 83°17.61'W (NAD 83 -83.293611)
NE "	27°41.82'N; (NAD 83 27.696944)	Long: 83°17.36'W (NAD 83 -83.289444)
SW "	27°41.57'N; (NAD 83 27.692778)	Long: 83°17.61'W (NAD 83 -83.293611)
SE "	27°41.57'N; (NAD 83 27.692778)	Long: 83°17.36'W (NAD 83 -83.289444)
Center	27°41.695'N;(NAD 83 27.6950)	Long: 83°19.485'W(NAD 83 -83.324722)

PROJECT PURPOSE:

Basic: (Re)nourish an existing Artificial Reef

Overall: (Re)nourish an existing artificial reef site, to provide habitat enhancement, fishing opportunities, material diversity, and long-lasting habitat for a wide variety of reef fish and other pelagic species.

PROPOSED WORK: To place clean pre-cast concrete pieces, concrete rubble, pipes, and other appropriate items that are clean and weighing no less than 500 pounds, on an existing site. Suitable materials of opportunity would be placed on the reef site, for an additional (10) year period) as (re)nourishment of the existing Artificial Reef Site. These and all materials will be placed in accordance with the Coastal Artificial Reef Planning Guide, prepared by the Joint Artificial Reef Technical Committee, the Gulf States Marine Fisheries Commission's Guidelines for Marine Artificial Reef Materials, and NOAA's National Artificial Reef Plan.

EXISTING CONDITIONS: The original bottom surveys show a water depth range of 95 - 96 feet. Substrate conditions in the area are unconsolidated sands with occasional patches of shell/sand mixture. The density of the bottom is moderately hard. No exposed limestone was observed within the project limits. The proposed reef area is 40 acres square. Material to be placed in 95 feet Mean Lower Low Water, and not to exceed a 47-foot profile with a minimum clearance of 47 feet.

MONITORING AND MAINENINCE: The applicant proposes annual inspections.

ENDANGERED SPECIES: The U.S. Army Corps of Engineers (Corps) has information indicating the potential for the endangered whales, sea turtles (Green, Loggerhead, Leatherback, Kemp's Ridley), and manatees to be present in the Gulf of Mexico. The Corps has made a determination that the proposed work may affect, but is not likely to adversely affect the whales, turtles or manatee that may visit the area. By separate coordination the Corps will initiate Section 7 Consultation with U.S. Fish and Wildlife Service.

ESSENTIAL FISH HABITAT (EFH): The U.S. Army Corps of Engineers has made a determination that the proposal could impact areas, in the Gulf of Mexico, utilized by sea turtles (Green, Loggerhead, Leatherback, Kemp's Ridley), and bottom area utilized by various life stages of red drum, penaied shrimp, reef fish, stone crab, spiny lobster, pelagic-migratory fish, snapper-grouper complex]. Our initial determination is that the proposed action would not have a substantial adverse impact on EFH or Federally managed fisheries in the Gulf of Mexico. Our final determination relative to project impacts and the need for mitigation measures is subject to review by and coordination with the National Marine Fisheries Service, via separate letter.

HISTORIC RESOURCES: According to the applicant, no historic resources would be impacted by the proposed work.

NOTE: This public notice is being issued based on information furnished by the applicant. This information has not been verified. The jurisdictional line has not been verified by Corps personnel.

AUTHORIZATION FROM OTHER AGENCIES: The Florida Department of Environmental Protection issued Noticed General Permit number 58-0205177-001 on November 6, 2002.

NOTE: *This public notice is being issued based on information furnished by the applicant. This information has not been verified.*

Comments regarding the application should be submitted in writing to the District Engineer at the above address within 20 days from the date of this notice.

If you have any questions concerning this application, you may contact Mary L. Saunders at the letterhead address, by electronic mail at mary.l.saunders@usace.army.mil, by fax at (813)769-7061, or by telephone at (813)769-7064.

IMPACT ON NATURAL RESOURCES: Preliminary review of this application indicates that an Environmental Impact Statement will not be required. Coordination with US Fish and Wildlife Service, Environmental Protection Agency (EPA), the National Marine Fisheries Services, and other Federal, State, and local agencies, environmental groups, and concerned citizens generally yields pertinent environmental information that is instrumental in determining the impact the proposed action will have on the natural resources of the area. By means of this notice, we are soliciting comments on the potential effects of the project on threatened or endangered species or their habitat.

IMPACT ON CULTURAL RESOURCES: Review of the latest published version of the National Register of Historic Places indicates that no registered properties, or properties listed as eligible for inclusion therein, are located at the site of the proposed work. Presently, unknown archaeological, scientific, prehistorical, or historical data may be lost or destroyed by the work to be accomplished.

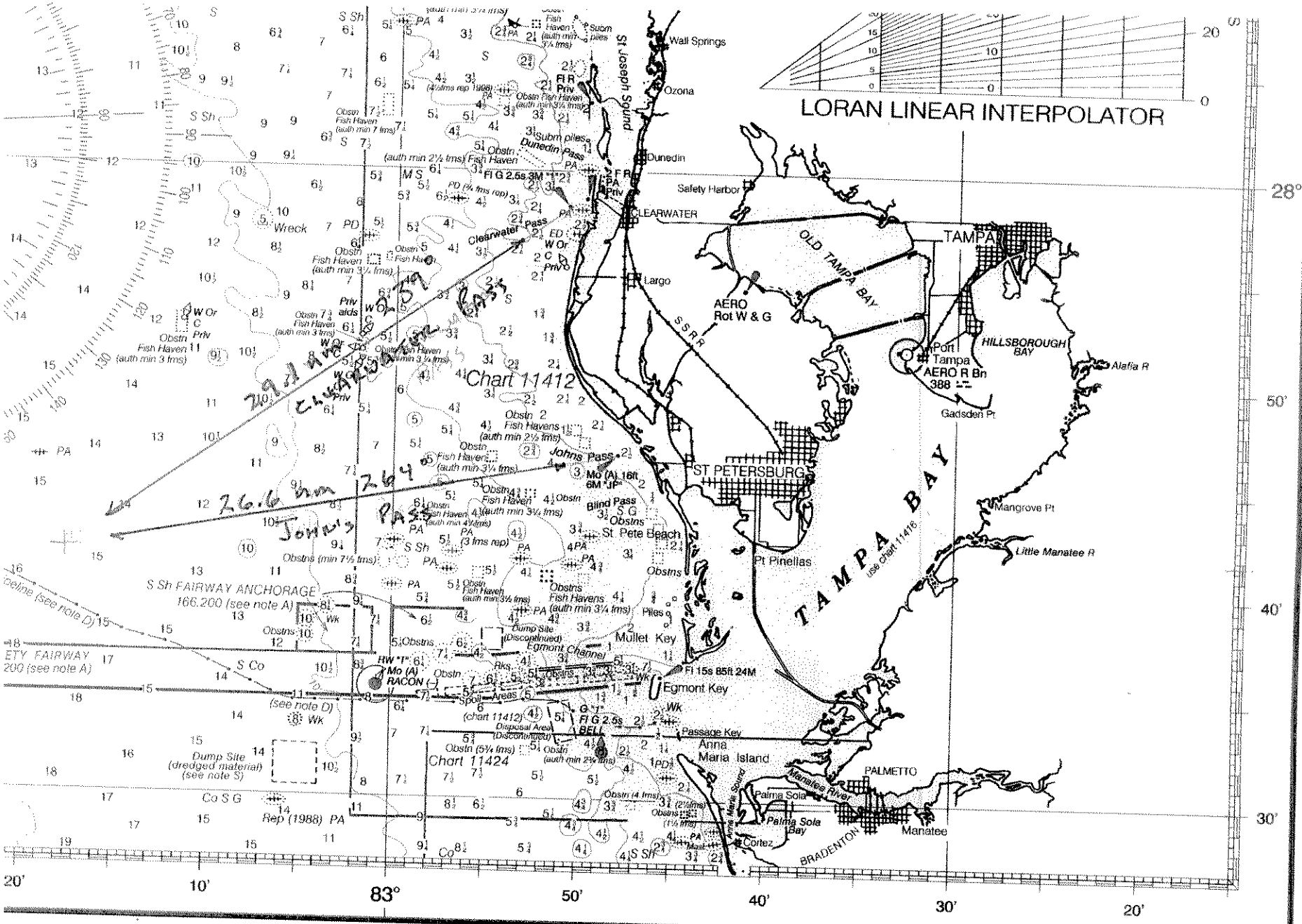
EVALUATION: The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including cumulative impacts thereof; among these are conservation, economics, esthetics, general environmental concerns, wetlands, historical properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and in general, the needs and welfare of the people. Evaluation of the impact of the activity on the public interest will also include application of the guidelines promulgated by the Administrator, EPA, under authority of Section 404(b) of the Clean Water Act of the criteria established under authority of Section 102(a) of the Marine, Protection, Research, and Sanctuaries Act of 1972. A permit will be granted unless its issuance is found to be contrary to the public interest.

The US Army Corps of Engineers (Corps) is soliciting comments from the public; Federal, State, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition, or deny a permit for this proposal. To make or deny this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

COASTAL ZONE MANAGEMENT CONSISTENCY: In Florida, the State approval constitutes compliance with the approved Coastal Zone Management Plan. In Puerto Rico, a Coastal Zone Management Consistency Concurrence is required from the Puerto Rico Planning Board. In the Virgin Islands, the Department of Planning and Natural Resources permit constitutes compliance with approved Coastal Zone Management Plan.

REQUEST FOR PUBLIC HEARING: Any person may request a public hearing. The request must be submitted in writing to the District Engineer within the designated comment period of the notice and must state the specific reasons for requesting the public hearing.

David S. Hobbie
Regulatory Division



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ED NO. 36

NSN 7642014010101
NGA REFERENCE NO. 11ACO11400

Tampa Bay to Cape San Blas

SOUNDINGS IN FATHOMS - SCALE 1:456,394

11400

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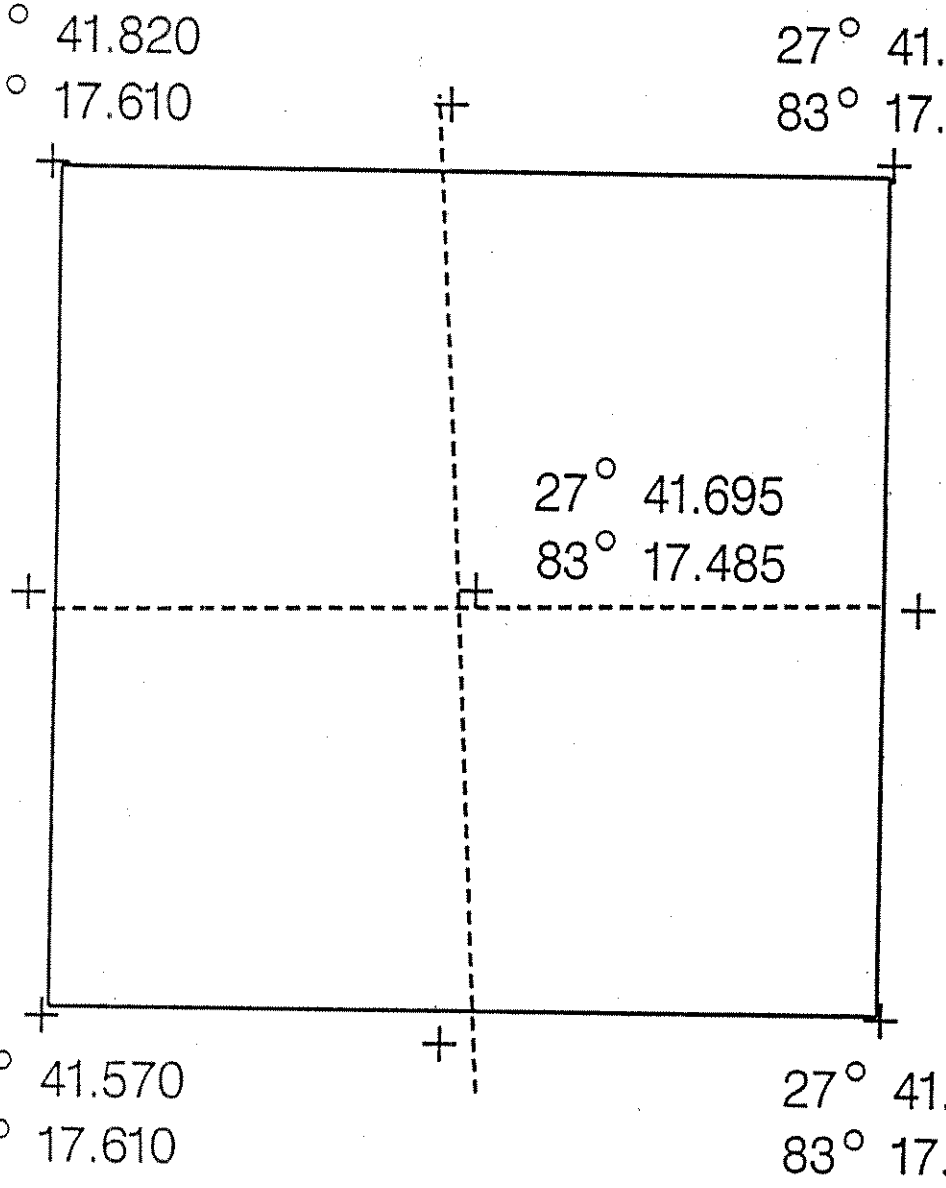

+ Coordinate Check Location

------- Bottom Survey Transects

Scale

200 Feet

HDR	Treasure Island II Deep-Water Reef	Coordinates

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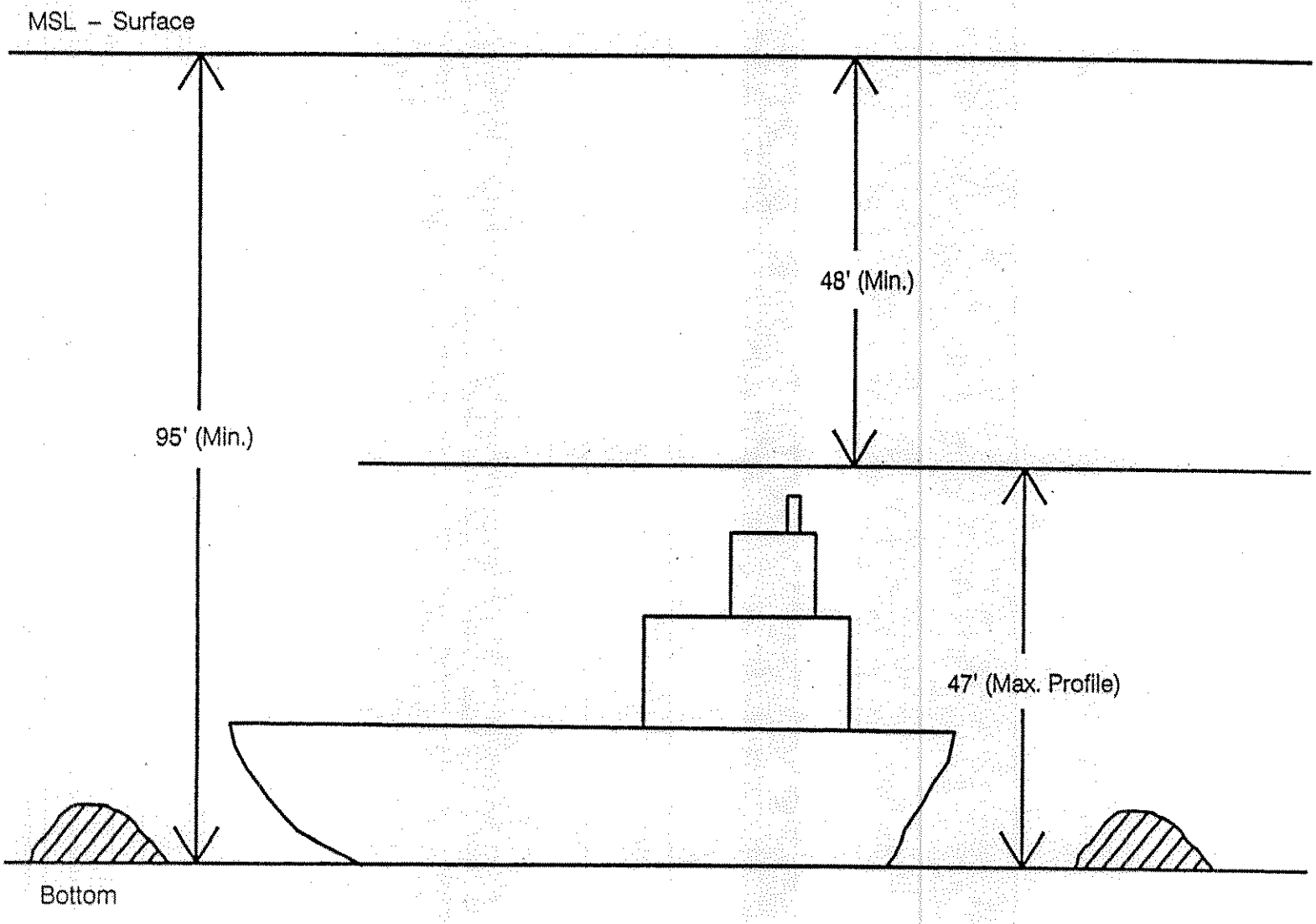

HDR

Treasure Island II Deep-Water Reef

Proposed Profile

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ARTIFICAL REEF PERMIT APPLICATION
TREASURE ISLAND II
DEEP-WATER REEF

REEF OBJECTIVES

The proposed location of the Treasure Island II Deep-Water Reef is intended to provide suitable site for the placement of a large marine vessel, concrete rubble, pipes, and other appropriate material. While other artificial reefs in Pinellas County are primarily within 12 nautical miles of the shoreline, the proposed location will provide a site that is further from the shore and will have less impact from recreational use.

The objective of the reef is to provide habitat for fish and other pelagic species. In addition, the intent of the reef is to provide fishing opportunities within a reasonable distance from shore.

REEF LOCATION

The site is accessible from Johns Pass and Blind Pass and is approximately 26.6 nautical miles 257° west of Johns Pass (Figure One). Coordinates were taken through the use of differential GPS with a degree of accuracy +/- 3m.

The center of the reef is Latitude 27° 41.695' Longitude 83° 17.485'.

The four corners are:

Northwest corner: Latitude 27° 41.820' Longitude 83° 17.610'
Northeast corner: Latitude 27° 41.820' Longitude 83° 17.360'
Southeast corner: Latitude 27° 41.570' Longitude 83° 17.360'
Southwest corner: Latitude 27° 41.570' Longitude 83° 17.610'

EXISTING CONDITIONS

Site surveys were conducted by scuba divers on 28 Aug 01. Additional site assessments were made in the preceding months to identify and appropriate site before detailed assessments were performed. The project area water depths range from 95 feet to 96 feet. Substrate conditions in the area are unconsolidated sands with occasional patches of shell/sand mixture. The density of the bottom is moderately hard. No exposed limestone was observed within the project limits.

Occasional holes were excavated by hand revealing hard pan or limestone approximately 1 to 3 feet below the surface. Figure Two shows the locations of the transects.

The prevailing current was to the north, typical of summer currents in the eastern Gulf of Mexico. Once the Gulf has reached a temperature equilibrium, the current flows to the north-northwest until late fall, early winter. The water depths at this location preclude the effects of typical daily wave energy.

As this site is 26 miles offshore, water quality will be consistent with the rest of the Gulf of Mexico. Water quality varies during the year with clear visibility in the winter and poor visibility in portions of the summer. The reduction of runoff in combination with cooler temperatures during the dry season is in contrast to the algal blooms during high nutrient loading and warm temperatures during the rainy season. Salinity is relatively constant at 32 to 34 ppt while dissolved oxygen decreases as the water gets warmer.

A one-quarter mile transect line with 100-foot intervals identified was placed on bottom. The transects were traversed from south to north with visual perpendicular surveys conducted every 300 feet. Another transect was placed from west to east with visual perpendicular surveys conducted every 300 feet. No hard bottom communities were observed. Occasional patches of *Caulerpa* spp. were identified. Video tapes of

the transects were taken and will be maintain in the project files. Copies of the tapes can be provided upon request.

The site is approximately two miles from extensive limestone ledges. It is envisioned the proposed location will benefit from the adjacent habitat as well as providing diversity.

REEF CONSTRUCTION

The proposed reef will be constructed of marine vessels, concrete rubble, and/or concrete culverts. Other material to be placed on the reef may include an appropriately cleaned dry dock. These and all materials will be placed in accordance with the *Coastal Artificial Reef Planning Guide* prepared by the Joint Artificial Reef Technical Committee, the Gulf States Marine Fisheries Commission's *Guidelines for Marine Artificial Reef Materials,* and NOAA's *National Artificial Reef Plan*. Other artificial reef research documents were utilized as reference materials for the development of the reef plan.

The proposed site is 1,320 feet (0.25 mile) on each side for a total project area of 40 acres. Figure Three is the typical reef placement design cross-section.

The construction sequence includes, but is not limited to, specific deployment location selection, pre-deployment notification, construction surveys, and post-deployment notification. The specific deployment location will assess the type of material to be placed, the location of previously placed material, and the objective of the material. Once the location has been surveyed, a pre-deployment notification, as required, will be provided to USACE, USCG, FDEP, and FFWCC. Such notifications will be for a series of events on the same reef with various materials. Notification will include the address for the point of departure, name and telephone number for a point of contact, specific coordinates and description and quantity of the materials, and water depths of the site.

Construction surveys include a bottom assessment immediately before material placement as well as a survey after placement to assess stability and proper placement. Upon successful deployment of material, a post-deployment notification will be provided, as required, to document the type and amount of material, the specific location, and any other pertinent information.

LONG TERM MANAGEMENT

Pinellas County is committed to the construction, development, and management of artificial reefs in a responsible manner. The County's Reef Management Plan utilizes sound best management practices based on the best technical and scientific information available and adapts it the fit local conditions.

The County will conduct and record periodic site inspections to insure compliance with established reef construction goals and objectives. Concurrent evaluations of reef research, along with observed results, will be utilized to modify the reef management plan as needed.

A reef management plan is included as an attachment.

Reef Construction Management Plan
Pinellas County, Florida

INTRODUCTION

Pinellas County's artificial reef program includes ten existing reef sites that are located from 3 to 21 miles offshore in the Gulf of Mexico, an area of inshore reefs, and one site located in Tampa Bay. Historically, since it's inception in 1975, the program used tires and other items collected by the Department of Solid Waste for placement on the reef sites.. While it was recognized as an opportunity to reduce landfill space demand through the disposal of solid waste, the known benefits of creating artificial reefs was widely accepted.

BACKGROUND

Through the involvement of several people, the efforts evolved into a more beneficial program through effective planning, materials management, and construction management. Essentially over the life of the program, marine biologists, engineers, planners, and the County's artificial reef crew observed how different materials reacted when placed in the marine environment and how various organisms reacted to the placed material.

Originally, the program started with a permitted area and the initial objective of the efforts was placement of material in the permitted area. Material changes were made after observations noted things such as scattering of tires and deteriorating steel items. Locations were based primarily on bottom conditions such as stable substrate and absence of live bottom. Currently, placements are not made just within boundaries of the permitted reef limits, but as clusters of grouped materials. The most recent reef locations have been selected because they are adjacent to natural habitat. In addition to higher densities of larval stages of attaching organisms, the opportunity for interaction of pelagic species increases the function and value of the artificial reef material and ultimately the habitat.

The shape and structure of the placed material are now taken into account. The reefs are intended to provide vertical relief for more pelagic fish species such as mackerel (Spanish and king), amberjack, cobia, and barracuda. Bait fish such as thread-fin herring and Spanish sardines congregate around the reefs with both low and high profiles. The bottom species such as grouper, snapper, and grunt take advantage of the openings and ledges created through the use of concrete culverts and bridge slabs. The County is experimenting with pre-fabricated designs to determine which species are attracted to the various shapes and sizes.

The inshore reefs have been built as mitigation to replace hard bottom habitat impacted by beach restoration projects. The structures are located 300 to 1500 feet offshore in

approximately 15 feet of water and have a relief of three to five feet. When the project is finished, a total of 29 reefs will have been constructed. There are no future plans for construction of inshore reefs.

The material is primarily composed of concrete culverts that are bordered by square concrete light poles to insure encasement of the culverts. The placement of culverts at the inshore reefs is carefully executed as a result of shallow water depths. Material has to be dense and stable to withstand the increased wave action of nearshore location.

HISTORICAL CONSTRUCTION TECHNIQUES AND MILESTONES

Many of the construction techniques and milestones are consistent with the Artificial Reef Program for Pinellas County as a whole. Therefore, as an example, a detailed discussion of the construction techniques is provided for the Rube Allyn Reef site. The Rube Allyn Reef was constructed through the use of several clusters of material. When the cluster of material is completed, material is no longer placed on the site. If a determination is made to place material on the reef site, then a new cluster of material is placed. The type of material is assessed when determining if a new cluster is appropriate. As each cluster of material is concluded, then a summary of the site is written through the use of placement forms.

One type of cluster utilizes a platform of concrete culverts as a base and placement of concrete light poles on the top. The light poles form a type of pyramid shape that, as observations have shown, result in fish populations that are diverse and dense at times. The clusters are approximately 50 feet in diameter and have a vertical relief of 15 to 20 feet. Pile cutoffs have been used at another location of Rube Allyn in the same manner as the concrete light poles. The clusters are 18 and 24 feet in diameter with 4 to 10 feet of relief. However, the cutoffs are shorter than the light poles and do not provide as much vertical relief. Observations of the two sites indicate that the diversity and biomass of fish is reduced at the sites with lower vertical relief.

Random placement of culverts has occurred in several locations that can be typified as various sizes of culverts packed tightly together. The clusters tend to be placed as a long pile 50-feet wide and 150-feet long with a vertical relief as high as 15 feet. The diversity created through this type of placement encourages occupation by reef fish including grouper (gag, red, and black) as well as extensive smaller fish such as lizard fish, slippery dick, goby, blenny, hawk fish, and sea bass.

Larger diameter culverts have been placed in an orderly stack on Rube Allyn. This created larger spaces in a site that is approximately 75 feet by 80 feet with 23 feet of vertical relief. The diversity and biomass of fish were reduced at this location during field observations.

MATERIAL TYPES AND EFFECTIVENESS

Several types of materials are used on Pinellas County's artificial reefs. Generally, the types can be grouped according to shape such as tubular, flat, solid, or hollow. Concrete culvert is the primary tubular shape and can range from 12 to 60-inch pipe. Culverts have been placed on most of Pinellas County's artificial reefs. Random placement of the culvert provides a variety of habitat including interstitial spacing between pipes, overhang space when the pipes are placed horizontally on the substrate, and cover for several species of fish provided by the openings of the pipes. Furthermore, the surface of the concrete culvert also provides opportunities for attached organisms such as sponge, soft coral, hard coral, bryozoans, and algae. Invertebrate grazers such as urchins and other grazers, such as trigger fish and sheephead are frequently observed on culverts.

Flat material includes bridge decking, pieces of sidewalk, or sections of concrete roadway. Sidewalk pieces are four-feet wide while most bridge and roadway sections are 12-feet wide. Smaller pieces of each are frequently found on the reefs. Bridge decking with attached support beams, provide a ledge type of habitat frequently used by grouper and snapper. When the flat surface of bridge decking, sidewalk, or road sections is exposed to excessive current, the surface is typically not colonized by attached organisms such as sponge, algae, barnacles, or coral. When the flat surface is protected by another piece of artificial reef material, the surface is colonized by attached organisms and suitable habitat is created for smaller reef fish such as lizard fish and as well as invertebrates such as crabs and urchins. When flat material is placed directly on the substrate, burrowing animals such as stone crabs, blennies, and gobies occupy the habitat created by interface of the material and the substrate.

Solid materials include many types of material such as manufactured concrete polygons, concrete rubble, native limestone, concrete light poles, and piling cutoffs. Manufactured tetrahedrons are cubicle and pyramid in shape and range from four to six feet per side. The solid materials used in artificial reef construction usually have rough surfaces suitable for recruitment of attached organisms. However, similar to flat material discussed above, the manufactured material that is exposed to currents tend to be poorly covered with attached organisms. The most effective arrangement of manufactured materials is random stacks of material.

Concrete rubble is typically the remains of building and roadway demolition projects. The size of rubble varies from fist-size to desk-size pieces of concrete and may include bricks and mortar. Rubble has a combination of flat surfaces, porous surfaces, and irregular shapes. This diversity provides opportunities for colonization by attached organisms as well as interstitial spaces. Rubble that is in contact with the substrate provides habitat for burrowing animals such as crabs and small fish.

Native limestone is mined, marine deposits throughout Florida. The size of these porous rocks is between 100 and 8000 pounds. The porosity of the limestone makes it an ideal substrate for colonization of marine organisms. As well, rubble is typically placed in

piles providing random sizes of interstitial openings and contact with the substrate. The curved surface of native limestone reduces the opportunity for the abrasive action of currents and sand. Colonization of native limestone is rapid as a result of the suitable surface for attached organisms.

Concrete light poles taper and vary in length from 10 to 40 feet long. The material is typically placed in a random fashion on top of other material creating a pyramid shape. This type of structure is frequented by schools of bait fish such as Spanish sardines, thread-fin herring, greenbacks, and menhaden. Snapper, primarily grey snapper, tend to occupy the lower portions of the pyramid preying on the bait fish attracted to the structure.

Hollow material includes manufactured concrete polygons, concrete junction boxes, and metal items such as surplus military vehicles and boats, barges, shipping containers, and dumpsters. Manufactured concrete polygons are pyramid in shape and have several holes of various shapes and sizes. The polygons range from four to six feet per side, the openings are typically square or triangular and range from four to twelve inches per side. These polygons are similar to solid manufactured material with respect to the surface colonization, interstitial spaces, and contact with the substrate. In addition to those attributes, the internal space of the hollow material provides habitat for grouper, snapper, and other fish typical of limestone ledges of west central Florida.

Concrete junction boxes include stormwater boxes with large openings on more than one side and range from four to ten feet per side. Telephone and cable junction boxes have one large opening with several four-inch openings along the sides. They range from two to eight feet, occasionally larger. The boxes have flat sides and provide limited opportunity for attached organisms, typically limited to one or two sides. The most effective use of this material is placement in a pile of other types of material, thereby providing diversity of habitat. The interior space provides habitat for more aggressive fish such as grouper and snapper. The larger openings associated with concrete junction boxes limit the suitable protection for smaller fish.

Surplus military vehicles include tanks and airplanes as well as marine vessels. Tanks have been placed at St. Pete Beach Reef. The tanks were typically placed upright. The primary habitat created includes the interface with the substrate as well as spaces among the various surface features and the internal portion of the tank. Airplanes are attached to other objects such as concrete blocks or barges. Similar to tanks, the airplane provides a surface for attached organisms and the internal spaces for pelagic species.

PREVIOUS MONITORING RESULTS

The Pinellas County Reef Construction crews provide casual observations of material that was previously placed. During construction of a new location within a permitted site, the divers use the previous material as a frame of reference. Observations include

the type of organisms that recruit as well as the type of material upon which the recruitment occurred.

Veteran's Reef is currently monitored on a quarterly basis using a two-meter wide transect for fish counts. Fish counts are limited to the species of interest as recreational value.

OBJECTIVES OF EACH REEF FOR FUTURE DEPLOYMENTS

Upon successful permitting of Pinellas County Reefs, the County will have active permits for Veterans, Rube Allyn, Indian Shores, South County, and P-2 reefs. The objectives of the reefs include providing diverse habitat and accessibility for the public. Of the five reefs, four are existing reefs and South County is a new site.

The selection of the types of material for use on the reefs will be based on previous successful construction techniques and qualitative data to include years of past deployments and diver surveys. Assessments of length, width, height, and stability issues as well as fish counts, biomass estimates, and seasonal observations will be considered. Finally, public feedback, comments, and other input provide additional information to Pinellas County to select the appropriate material and location for each deployment.

Placement of material on the existing reefs will be performed such that new material is not placed on existing material. Furthermore, material will be placed to create clusters scattered approximately 50 to 100 feet apart. The clusters will be made up of a variety of sizes and shape of materials including, but not limited to concrete culverts, bridge decking, sidewalks, pile cutoffs, concrete light poles, manufactured modules, properly prepared ships and barges, concrete rubble, and native limestone boulders.

Material placed on the inshore reefs for mitigation will consist of concrete culverts placed carefully. The relatively shallow water depths require placement of individual pieces in an orderly fashion. The windows of opportunity are small as a result of weather conditions. Visibility is extremely limited and wave action reduces the capability of the Tortuga to place material.

INTENDED RESULTS MATERIAL AND CONFIGURATION

When the cluster of material is completed, material is no longer placed on the site. If a determination is made to place material on the reef site, then a new cluster of material is placed. The type of material is assessed when determining if a new cluster is appropriate. As each cluster of material is concluded, then a summary of the site is written through the use of placement forms.

The inshore reefs, while providing habitat in a different location than the rest of the County's artificial reef program, have a shorter duration. The substrate in the required locations is looser sands than typical sites and there is more sediment transport at the

inshore reef sites. The reefs appear to silt in quickly from the low profile required for the shallow water depths. In reality, the material is settling into the bottom, as the depths remain the same, yet the profile is reduced over time. Species such as snook, redfish, jewfish, grunts, and sheep head have been observed utilizing the inshore reefs for foraging and cover.

Target species include pelagic species such as king mackerel, Spanich mackerel, amberjack, and barracuda; reef fish such as grouper, snapper, hog fish, trigger fish, and sea bass; and bottom dwellers such as flounder. As well as fish, the other target species for the Pinellas County Reef Construction program include all attached organisms such as coral, sponge, bryozoans, and algae as well as invertebrates such as crabs and other mollusks.

BUOYS

Over time, buoys have been placed at each of the reef sites. Typically, the original placement included a buoy at the north, center, and southern point of the permitted reef site. Past and presently permitted sites are rectangular with buoy placement in the center pursuant to the U.S. Coast Guard Permits. Buoys will be maintained in the center of current reef sites. However, the buoys for the other sites will not be maintained as a result of fiscal concerns; the sites are on nautical charts.

The Inshore reefs demonstrate the intense maintenance requirements. The conditions deteriorate the chains quicker from the rougher conditions. A strong storm can wipe out four or five buoys in one event at the inshore reefs. There is no requirement to mark (buoy) these reefs.

Buoy placement logs have been maintained by the reef crew and are kept on file at the Sand Key offices.

LONG TERM OBJECTIVES

Long-term objectives include increased habitat and diversity while providing recreational value to the public. The primary method of obtaining that goal is to create artificial reefs that will remain for many years along Pinellas County's coastline. Habitat diversity is created through a mixture of materials placed at appropriate spacing. According to Dr. William Lindberg (1996), the development of smaller patch reefs closer together created more competition and reduced the actual biomass potential from artificial reefs. Accordingly, the large patch reefs spaced further apart created individual communities of increased biomass.

Pinellas County's program has evolved into the placement of material in clusters around the permitted reef site. Some material is placed directly adjacent to the buoy to provide an opportunity for fishermen without depth finders to know where some material has

been placed. Occasionally, other clusters of material are placed away from the buoy to reduce fishing pressures. These clusters are not identified on the County's brochures or web sites.

Long-term objectives will not include the placement of material on the inshore reefs. Once the mitigation reefs are completed, the effort required can be more useful in offshore reefs. The inshore reefs do not last as long and sustain more damage from storm events. Construction of the 29 mitigation reefs was required by FDEP to mitigate impacts from a beach renourishment project.

SHORT TERM OBJECTIVES

Short-term objectives include placement of material such as ships and barges on new reefs to provide immediate cover. The Veteran's reef utilized a contract for the placement of manufactured modules and native limestone, as well as three barges, as part of an effort to provide immediate cover in a new site. Other short-term objectives include placement of material in a single location within a short time frame. This prevents the placement of material on top of previous placements that have benefited from recruitment of attached organisms. Typically the time frame is less than one month and preferable within a two week period.

REEF LOCATION OBJECTIVES

The locations of the County's artificial reef are intended to provide active placement sites ranging from north Pinellas County (Veteran's Reef), mid-county (Rube Allyn and Indian Shores), and then extending to south county (South County Reef). A deep-water site, Pinellas Number 2 (or P-2) will provide an opportunity for placement of large vessels. These locations provide access to boaters from all parts of coastal Pinellas County.

The inshore reefs are located 300 to 1500 feet offshore in approximately 15 feet of water. The reefs are easily accessible to all sizes of boats, weather permitting. To date, the boaters observed are fishermen; no divers have been seen utilizing the reef. No other near-shore reefs are anticipated.

PUBLIC INVOLVEMENT

As the artificial reefs of Pinellas County are generated with public money through grants, taxes, or tipping fees from collection of solid waste, the information regarding the reefs is public. Pinellas County has a brochure and web site that is periodically updated to reflect current information. Information includes location, type of material, material profile, water depth, and some background information regarding the reef.

As new reefs are developed, the notification of the reef sites occurs through Pinellas County's Public Information Office. Unique deployments of material are also publicized through the Public Information Office.